SPOTLIGHT CURSOR

FIELD OF THE INVENTION

The present invention relates to an apparatus and method for eliminating clutter in a graphical user interface by revealing secondary content in response to movement of the cursor.

BACKGROUND OF THE INVENTION

5   In complex graphical user interface design, a challenge exists to strike a proper balance between functionality and screen clutter that impedes ease of use. Controls and annotation essential for the user to accomplish a task are primary content. Graphical User Interfaces (GUI's) often contain controls and annotations not critical for task completion. These controls and annotations are typically designed to supplement and explain the operation of the interface. Such controls and annotations are designated as secondary content. Examples of secondary content are

10   items for context help popups, textual explanations and other non-critical functions. Although intended to enhance ease of use, secondary content often clutters the screen creating more visual "noise" that must be read and prioritized by the user in order for the user to progress through the task.

15   A need exists for a way to make secondary content "invisible" and to reveal the secondary content only when it might be needed and where the user is placed in control of the breadth of the exposure of the secondary content. Therefore a further need exists for a way to reveal items of secondary content based on actions taken by the user such as movement of the cursor.

United States Patent 6,018,345 discloses movement and presentation of the cursor used to

indicate the presence of links and means of traversing the links. The cursor is presented in a first

manner while the cursor is over non-link elements in the first page. As the cursor is moved over

the links, the cursor is presented in a second manner indicating to the user how to traverse to the

second page.   United States Patent 5,526,478 discloses a computer implemented method of

5   annotating a geometric figure displayed and manipulable in three-dimensional representation on

a display of a computer system with a pointer. The pointer is also displayed and manipulable in

three dimensional representation on the display. The particular view orientation of the geometric

figure with the pointer can be preserved such that the particular view orientation of the geometric

figure with the pointer can later be retrieved. When the pointer is activated, the pointer can be

10   associated with a multimedia function such that when the pointer is again activated, the multi-

media function is executed.   United States Patent 5,488,685 discloses an object oriented graphic

user interface (GUI) having overlapping windows and an access window having topics, index

and "look for" button functions for selection by a user. Selection of one of the button functions

results in the generation and display of entries in a predefined area of the access window. Visual

15   cues in the form of coach marks are generated for identifying features on the display. The coach

marks encircle, point to, and/or underline objects, features, icons, folders and other display

elements to assist the user in operating the computer.

What is needed beyond the prior art is a simple and effective way to cause secondary content

to be revealed based on user actions.

20   SUMMARY OF THE INVENTION

The invention which meets the needs identified above is an apparatus and method for

displaying a secondary layer of information in a graphical user interface where the second layer

of information is revealed when a point on the circumference defined by radius "r" originating at

the x,y coordinates of the cursor covers a point in a secondary content of the second layer.   The

circumference may be set to trigger appearance of secondary content gradually, all at once or to

trigger the appearance of all secondary content in a predefined zone.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 depicts a distributed data processing system in which the invention may be

implemented;

Figure 2 depicts a computer in which the software to implement the invention may be stored;

Figure 3 depicts the spotlight cursor without displayed secondary content;

Figure 4 depicts the spotlight cursor with displayed secondary content;

Figure 5 depicts a flow chart for a first program controlling the spotlight cursor;

Figure 6 depicts a flow chart for a second program controlling configuration of the spotlight

cursor;

Figure 7 depicts a continuation of the flow chart in Figure 6;

Figure 8 depicts an example of gradual display;

Figure 9 depicts an example of all display; and

Figure 10 depicts and example of zone display.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Figure 1 depicts a pictorial representation of a distributed data processing system in which

the present invention may be implemented and is intended as an example, and not as an

architectural limitation, for the processes of the present invention. Distributed data processing

system **100** is a network of computers which contains a network **102**, which is the medium used

to provide communications links between various devices and computers connected together

within distributed data processing system **100**. Network **102** may include permanent connections,

such as wire or fiber optic cables, or temporary connections made through telephone connections.

personal computers or network computers. Distributed data processing system **100** may include

additional servers, clients, and other devices not shown. In the depicted example, distributed

data processing system **100** is the Internet with network **102** representing a worldwide

collection of networks and gateways that use the TCP/IP suite of protocols to communicate with

one another. Distributed data processing system **100** may also be implemented as a number of

different types of networks, such as for example, an intranet, a local area network (LAN), or a

wide area network (WAN).

Figure 2 depicts computer **200**. Although the depicted embodiment involves a personal

computer, a preferred embodiment of the present invention may be implemented in other types of

data processing systems. An exemplary hardware arrangement for computer **200** follows.

Keyboard **222** and display **223** are connected to system bus **210**. Read only memory (ROM) **230**

contains, typically, boot strap routines and a Basic Input/Output System (BIOS) utilized to

initialize Central Processing Unit (CPU) **220** at start up. Random Access Memory (RAM) **240**

represents the main memory utilized for processing data. Drive controller **250** interfaces one or

more disk type drives such as floppy disk drive **252**, CD ROM **254** and hard disk drive **256**. The

number and type of drives utilized with a particular system will vary depending upon user

requirements. A network interface **260** permits communications to be sent and received from a

network. Communications port **270** may be utilized for a dial up connection to one or more

networks while network interface **260** is a dedicated interface to a particular network. Programs

for controlling the apparatus shown in Fig. 2 are typically stored on a disk drive and then loaded into RAM for execution during the start-up of the computer.

Figure 3 depicts the appearance of spotlight cursor **320**. Spotlight cursor **320** has light **314**, cursor **310** and "c" **330**. Cursor **310** has tip **312**. When referring to the coordinates of the cursor, the coordinates are those of tip **312**. The tip is defined as the most forward point of the arrow displayed as the cursor. Persons skilled in the art are aware that any other point on the cursor could be chosen. Tip **312** defines the center of light **314**. Light **314** is an area defined by a circle with circumference "c" **330**. Light **314** has radius "r" (not shown) which is the straight line distance from tip **312** to "c" **330**. Circumference "c" may appear as a sharp line in contrast to screen **310**, a broken line in contrast to screen **310**, a soft line in contrast to screen **310** or a fuzzy line blending with screen **310**; however, no matter what appearance is given to the circumference, "c" will be defined mathematically in relation to radius "r" for the purpose of spotlight cursor **320**. As shown in Fig. 3, spotlight cursor **320** has not caused any secondary content to appear on screen **310**. Screen **310** has "Invert" checkbox **340**, "Mirror" checkbox **350** and "Print File Information" checkbox **360**.

Figure 4 depicts screen **310** with spotlight cursor **320** in a new position. The user has moved cursor **310**. As cursor **310** moved, light **320**, with "c" **330** and center coinciding with tip **312** of cursor **310**, also moved. Secondary content information icons have appeared. Specifically "Invert" checkbox information icon **410** has appeared adjacent to "Invert" checkbox **340**, "Mirror" checkbox information icon **420** has appeared adjacent to "Mirror" checkbox **320**, and "Print file information" checkbox information icon **430** has appeared adjacent to "Print file information" checkbox **360**. As will be explained in further detail below the appearance of

"Invert" checkbox information icon **410**, "Mirror" checkbox information icon **420** and "Print file information" checkbox information icon **430** were caused by covering with "c" of spotlight cursor **320**.

As used herein, "cover" means the act of a point on a secondary content being contacted by a point on "c" or being contained within the boundary of "c" or the coordinates of a point on "c" coinciding or equaling coordinates of a point on a secondary control, or a point on the boundary of a pre-defined zone containing one or more secondary contents.   As used herein, secondary content means text, icons, images or controls. The introduction of secondary content in a GUI is done by the application programmer, taking advantage of the capability and availability of the spotlight cursor.

The method for using the spotlight cursor is as follows. The program obtains the x,y coordinates of the cursor. Next, the program applies the pre-selected radius to define a circle of circumference "c" with origin at x,y (tip **312** of Fig. 3) and radius "r". Next the program determines whether or not there are any secondary contents that are within the circumference of the circle. If there is a secondary content within circumference "c" then the secondary content will be activated and revealed in the primary layer of the GUI.   If there are no secondary contents within the circumference "c" of the circle, then the program does nothing. The program cycles each time the cursor moves (each time the cursor coordinates change). The program may be incorporated into an operating system, an application, or the program may be a plug-in for adaptation to a pre-existing program. Once the spotlight feature is active, no further action is needed on the user's part

Figure 5 depicts the flow chart for the process of using spotlight cursor **320**.   First, the

program determines whether or not the cursor has moved. If the cursor has not moved, the

program goes to stop **590**. Cursor movement activates the program. If the cursor has moved, the

program determines whether or not the spotlight cursor is on (**530**). If the spotlight cursor is not

turned on, the program will proceed to stop 590. If the spotlight cursor is turned on the program

will proceed to obtain the coordinates of the cursor (**540**). Next, the program will use the cursor

coordinates and "r" to calculate the location of "c", where "c" is the circumference of a circle of

radius "r" (**550**). The value of "r" will be set by a configuration program, a default value or a

setting selected by the programmer of the application. Next, the program will determine

whether or not "c" has covered secondary content (**560**). If "c" has covered secondary content,

the program will cause the secondary content to be displayed (**580**). If "c" has not covered a

secondary content, the program hide secondary content that has been previously displayed (**570**)

and go to stop **590**. If "c" has covered a secondary content, the secondary content will be

displayed (**580**). The secondary content will be displayed according to a method of appearance

chosen in a configuration program.

Figure 6 depicts a flow chart for the program for configuration of the spotlight cursor. The

program begins (**610**) and displays a menu (**612**). First, the program determines whether or not

the secondary content are to be displayed (**614**). If the user selects "no", the program will set "r"

= 0 and go to end (**656**). By setting "r" = 0, the spotlight cursor is rendered inoperable as there

will be no "c" to cover secondary content. If secondary content are to be displayed, the program

will determine whether or not "r" has been selected. If the user has not entered "r", the program

will set "r" to a default value. If the user has set "r" the program will determine whether or not

the user has set the intensity (**624**). If "r" is set to a minimum value "1", then spotlight cursor

320 may not be visible at tip 312 of cursor 310. However, spotlight cursor 320 will have a

minimum "c" to effect display of secondary content. The intensity is the brightness of the circle

of light with circumference "c". If the user has not set the intensity, the program will select the

default intensity and the program will set the default value for the intensity (626) and the

5   program will go to step 624 and enter the value for the intensity. If the user sets the intensity, the

program will go to step 628 and enter the value for the intensity. Next, the program will

determine whether or not a color has been selected for the area inside "c". If the user does not

select a color for the area inside "c" the program will set the color to the default color and the

program will go to step 634 and enter the color. If the user selects a color for the area inside "c",

10   the program will go to step 634 and enter the color. Next, the program will determine whether a

color has been selected for "c". If a color has not been selected for "c", the program will select

the default color for "c" and the program will go to step 640 and enter the color. If the user

selects a color for "c" the program will go to step 640 and enter the color. Next, the program will

determine whether the configuration of "c" has been selected (642). If the user has not selected a

15   configuration for "c", the program will set the configuration of "c" to the default configuration

and the program will proceed to step 646 and enter the configuration. If the user has selected a

configuration for "c", then the program will enter the configuration for "c" (646). Next, the

program will determine the mode of appearance of secondary controls. If the user selected a

mode of appearance for secondary controls, the program will enter the mode of appearance of

20   secondary controls (652). If the user has not selected a mode of appearance for secondary

controls, then the program will go to a routine shown on Figure 7 via connection 650.

Referring to Fig. 7, the program will determine whether or not "gradual appearance" has

been selected (**710**). If "gradual appearance" has been selected, the program will set the

appearance of secondary content for "gradual appearance" and go to step **770** which will set the

display to reveal appearance when covered by "c". If the user has not selected "gradual" then the

program will determine whether or not the user has selected "all at once" (**730**). If the user has

selected "all at once" then the program will set appearance for "all at once" and the program will

go to step **790** which will set the computer to reveal secondary content when covered by "c".

Next, the program will determine, whether or not the user has selected "zone" (**750**). If the user

has not selected "zone", then the program will go to step **790** which will cause the computer to

reveal secondary content when covered by "c". Then the routine will return to the main

program via connector **654**. Referring again to Fig. 6, the program will then enter the secondary

definition, and end **656**.

Figure 8 depicts circumference "c" gradually revealing a secondary content item. Spotlight

cursor **320** has circumference **330** and light **314**. Secondary content item **850** has outer edge **860**.

When circumference **330** covers a point on outer edge **860**, secondary content item **850** will start

to be displayed. In figure 8, circumference **330** has passed over outer edge **860** and intersecting

area **840** is revealed while remainder area **342** is not displayed. As circumference **330** advances

and cover additional points of secondary item **850** intersecting area **840** will grow and remainder

area **342** will decrease.

Figure 9 depicts circumference "c" revealing secondary content item **950** all at once.

Spotlight cursor **320** has circumference **330** and light **314**. Secondary content item **950** has outer

edge **960**. When circumference **330** covers a point on outer edge **960**, secondary content item

950 will be fully displayed. There will be no intersecting area or remainder area. No matter

what point on outer edge **960** of secondary content item **950** is covered by circumference **330**, all

of secondary content item **950** will be displayed.

Figure 10 depicts circumference "c" revealing a group of secondary content by covering a

point in the predetermined zone.   Spotlight cursor **320** has circumference **330** and light **314**.

5   Secondary content items **1050, 1052** and **1054** are positioned within pre-defined zone boundary

1060. When circumference **330** covers a point on zone boundary **1060**, all three secondary

content items **1050, 1052** and **1054** will appear fully displayed at the same time.

The advantages provided by the present invention should be apparent in light of the

detailed description provided above. The description of the present invention has been

10   presented for purposes of illustration and description, but is not limited to be exhaustive or

limited to the invention in the form disclosed. Many modifications and variations will be

apparent to those of ordinary skill in the art. The embodiment was chosen and described in order

to best explain the principles of the invention the practical application and to enable others of

ordinary skill in the art to understand the invention for various embodiments with various

15   modifications as are suited to the particular use contemplated.

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